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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,458	09/28/2005	Kazuo Kubota	0425-1178PUS1	3849
2292	7590	11/27/2006	EXAMINER	
BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			CORDRAY, DENNIS R	
			ART UNIT	PAPER NUMBER
			1731	

DATE MAILED: 11/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/525,458	<b>Applicant(s)</b> KUBOTA ET AL.	
	<b>Examiner</b> Dennis Cordray	<b>Art Unit</b> 1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/14/2006</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments, see pp 10-11 and 14, filed 9/25/2006, with respect to the rejections of Claims 1-8 and 10-12 under 35 U.S.C. 102(b) as anticipated by Honig et al or Chen et al have been fully considered and are persuasive. The rejections have been withdrawn.

Honig et al discloses that the cationic polymer (corresponding to A) and polymer particles (corresponding to B) are added separately to the papermaking suspension rather than being combined into a polymer emulsion. Although the instant disclosure recites on p 27, 2<sup>nd</sup> par that the polymer particles (B) and cationic polymer (A or A') can be added separately to the suspension, the claims recite an emulsion comprising (A) or (A') and (B), which is added to the suspension, therefore Honig et al does not describe every element of the claims.

Chen et al discloses a cationic starch having a degree of substitution of 0.045, but does not disclose the nitrogen content. Chen et al thus does not describe or make inherent every element of the claims.

However, upon further consideration, new grounds of rejection are made as detailed below.

In regard to Applicant's arguments filed with respect to the rejections of claims over Honig et al or Chen et al, the following comments are offered. Applicant argues on pp 14-15 that the objective of Honig et al and Chen et al is improving retention, drainage and product formation. Applicant also argues that both references prefer a more ionic

Art Unit: 1731

polymer than the claimed invention, and both use crosslinking. Applicant indicates that Honig et al cites polymers from EP 273605 as having too small of an ion content to fall within the present invention. Applicant further argues that the disclosure of Chen et al is thus completely inconsistent with the instant invention. Honig et al is not used in the current rejections.

As detailed in the previous Office Action, Chen et al discloses an emulsion comprising a siliceous material, an organic microparticle, and a cationic starch or cationic synthetic organic polymer that is added to the fibrous suspension. The composition comprises embodiments that significantly overlay the composition recited in the instant claims. Chen et al discloses that the components can be combined and introduced to the papermaking suspension as a single composition (p 4, par 47). The composition flocculates the papermaking suspension. With regard to Applicant's discussion on pp 12-13 of the advantages of improved stiffness and bulk in a pulp sheet made using the instant invention, it is noted that the only claim that recited stiffness, Claim 12, has been cancelled. No claims recite bulk. It is also known that starch adds stiffness to paper (if evidence is needed, see Seger et al, 6146494, col 14, lines 5-9), thus a solution comprising a starch would be expected to provide some stiffness. Furthermore, polymers are often used for multiple simultaneous purposes in papermaking (if evidence is needed, see Auhorn et al, 6083348, col 2, lines 34-37). As discussed in the previous Office Action, a composition substantially identical to the claimed composition is presumed to have the same properties, thus the embodiments

Art Unit: 1731

disclosed by Chen et al that overlay the compositions of the instant invention will also provide stiffness and bulk to a paper made therefrom.

In regard to the use of crosslinking, the Disclosure as originally filed fails to recite that there is no crosslinking in the polymer particles (B), only that the particles comprise at least vinyl monomer-derived structural units. The open claim language thus provides for additional monomer units, including crosslinking units. In addition, crosslinking is optional, not required, in the disclosure of Chen et al (p 1, par 15).

The new rejection detailed below is based on anticipation or obviousness. The data in Tables 1 and 2 on pp 39-40 of the Disclosure support the amendments to Claims 1 and 9 and have been considered with respect to special properties provided by the claimed composition. However, the data appear to indicate that the special advantages of the invention are due to the use of a cationic natural polymer rather than to the changes recited in the amended claims that limit the composition of the polymer particles. The compositions used in the comparative samples, which do not provide acceptable stiffness and bulk, comprise at least 95% of monomers from fatty acid esters (vinyl acetate) or styrene. Comparative samples 1-3 also comprise less than the amounts of anionic and nonionic hydrophilic monomers recited in newly added Claims 13 and 14. The comparative examples lack the presence of a cationic natural polymer.

#### ***Oath/Declaration***

The Declaration under 37 CFR 1.132 is acknowledged. The data for Examples 11-16, when compared with the data from the originally filed Disclosure, appear to indicate that using a high percentage of dimethyl acrylamide and laurel methacrylate (a

Art Unit: 1731

vinyl fatty ester) with some acrylic acid or a high level of acrylamide, without a cationic natural polymer, result in unacceptable stiffness and bulk. These data do not add additional support for the amendments to the claimed invention, but reinforce the originally disclosed data that a cationic natural polymer is necessary.

***Claim Rejections - 35 USC § 103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6-11, 13-16 and 18-20 are rejected under 35 U.S.C. 102(a or e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Chen et al (US 2006/0066540).

Claims 1-2, 4, 10-11, 13-14: Chen et al discloses an emulsion comprising a siliceous material, an organic microparticle, and a cationic starch or cationic synthetic organic polymer. The microparticles comprise from 0-99 parts by weight of a nonionic

Art Unit: 1731

monomer, which can be vinyl acetate or methyl (meth)acrylate (vinyl acetate is recited as a preferred monomer on p 20 of the instant Specification as an example of a vinyl fatty ester), and 100-1 parts by weight of a cationic or anionic monomer (p 3, par 35). The emulsion is added to the fibrous suspension (internal addition) as a drainage and retention aid in papermaking (Abstract; p 5, pars 51-52). The monomers of the microparticles need not contain a nonionic hydrophilic group, thus the limitation of Claim 14 is anticipated. The disclosed composition significantly overlays the claimed composition. Chen et al discloses that the components can be combined and introduced to the papermaking suspension as a single composition (p 4, par 47).

Claim 3: Using the calculations discussed in the previous Office Action, embodiments of Chen et al overlay the composition instant claims, and thus the polymer particles have the claimed  $T_g$  of less than 90 °C.

Claims 6, 8, 18: The cationic polymer and microparticles are each added in an amount from 100 to 2000 ppm by weight (0.01 to 0.2 wt %) based on the dry weight of the suspension (pp 5-6, pars 58-59), which overlays the claimed range as well as the claimed ratio of cationic polymer to microbead.

Claim 7: The siliceous material, organic microparticle, and a cationic starch or cationic synthetic organic polymer are added to the suspension in a papermaking process (pp 4-5, par 48; p 6, par 68), thus the paper made from the suspension has organic microparticles and a cationic starch or cationic synthetic organic polymer inside and on the surface.

Claims 9 and 20: Chen et al does not disclose a synthetic cationic polymer having the claimed viscosity. However, Chen et al discloses embodiments comprising a synthetic high molecular weight cationic polymer in the emulsion (p 4, par 44). The polymer comprises monomers used for the microbeads, thus can have a  $T_g$  of less than 90 °C. The ionicity is from 1 to 100 mole percent, thus the cationic polymer, which comprises amino or quaternary ammonium cationic monomers compounds (p 4, par 44; p 3, pars 30-32), has a nitrogen content of less than 1.0 weight percent for some embodiments. The disclosed monomer units are vinyl-derived units. The disclosed polymer composition is at least as detailed as the claimed synthetic cationic polymer composition, thus possesses the claimed viscosity, or at least it would have been obvious to one of ordinary skill in the art obtain the claimed viscosity because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

Claims 15 and 19: Chen et al discloses particle size of less than 750 nm (0.75  $\mu$ ) and preferably less than 300 nm (0.3  $\mu$ ), which lies within the claimed ranges (p 2, par 29).

Claim 16: Chen et al discloses that the microparticles are prepared by emulsion polymerization (p 3, par 37).



Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al in view of Wurzburg ("Modified Starches: Properties and Uses" CRC Press, Inc. Boca Raton, FL, 1986, pp 116-117).

Chen et al discloses a cationic starch having a degree of substitution of 0.045, but does not disclose the nitrogen content.

Wurzburg teaches that a popular method of cationizing starches is via 2,3-epoxypropyltrimethylammonium chloride, which results in a 2-hydroxypropyltrimethylammonium chloride group attached to the starch residue via an ether linkage. Using 162 as the molecular weight of the anhydroglucose unit of a polysaccharide and 117 for the pendant ammonium group (without chloride), the degree of substitution, based on nitrogen atoms per anhydroglucose unit, can be converted to a nitrogen content of 0.38 weight percent, which lies within the claimed range.

Chen et al, Wurzburg and the instant invention are analogous as pertaining to the use of cationized starches. It would have been obvious to one of ordinary skill in the art to cationize the starch with 2,3-epoxypropyltrimethylammonium chloride and thus obtain the claimed nitrogen content in the paper of Chen et al in view of Wurzburg as a well known and popular cationizing agent.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al in view of De Wacker et al (4940741).

Chen et al do not disclose that the microparticles are polymerized in the presence of a cationic polymer.

Art Unit: 1731

De Wacker et al discloses that cationic starch acts as a stabilizer against agglomeration and settling in the emulsion polymerization of vinyl acetate polymers (Abs; col 3, lines 36-52).

The art of Chen et al, De Wacker et al and the instant invention is analogous as pertaining to emulsion polymerization of vinyl acetate containing polymers. It would have been obvious to one of ordinary skill in the art to polymerize the monomers of the microparticles in the presence of a cationic starch in the paper of Chen et al in view of De Wacker et al to obtain an emulsion stabilized against agglomeration and settling.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Cordray whose telephone number is 571-272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1731

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*ORe*

DRC

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